

REMARKS

Claims 1-9, 11-15, and 17-24 are presently pending in this application. Claims 1, 8, 9, 12, 14, 15, 22, and 23 have been amended to more particularly define the invention. Claims 10 and 16 have been canceled in the interest of expediting prosecution. It is noted that the claim amendments are made only to further emphasize aspects of the claimed invention, and are not made to distinguish the invention over the prior art or narrow the claims or for any statutory requirements of patentability. Further, Applicants specifically state that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Claims 8-21 were rejected under 35 U.S.C. §112, first paragraph, with the contention that these claims contain subject matter not adequately described in the specification. Claims 1-2, 22-24 were rejected under 35 U.S.C. §102(b) as being anticipated by Patton, III, U.S. Patent No. 5,889,629. Claims 3-5 and 7 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Patton, III, in view of Smith, et al., U.S. Patent No. 6,546,456. Claim 6 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Patton, III, in view of Smith, et al., and Kao, United States Patent No. 5,374,933. These rejections are respectfully traversed.

The Rejection Under 35 U.S.C. §112

The rejection of claims 8-21 under 35 U.S.C. §112, first paragraph contends that a first speed and a second speed for driving the head are not disclosed in the specification. The specification clearly brings out that the head is driven. Inherently, then, the head is driven at a speed, which is a first speed. Claims 8, 11-14, and 17-21 specified only one speed,

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designated a "first" speed. Since a first speed is disclosed in the specification, this rejection is inappropriate and should be withdrawn as to claims 8, 11-14, and 17-21.

Claims 9 and 15 have been amended to delete reference to the second speed. Accordingly, this rejection is overcome as to claims 9 and 15.

In the interest of uniformity, claims 8 and 14 have also been amended to delete reference to the first speed.

Claims 10 and 16 have been canceled, and so this rejection is moot as to claims 10 and 16.

It is accordingly submitted that the rejection under 35 U.S.C. §112 is overcome.

The Claimed Invention

The claimed invention is directed to a disk drive apparatus and to a method of controlling a head drive section. The apparatus and method are particularly suitable for reading from and writing on an information recording disk. In accordance with an exemplary embodiment of the invention, a disk drive apparatus, which receives a power voltage of a level equal to or less than a predetermined rating level, includes a forcible restoring section which forcibly brings the head of the apparatus to a retract position when the power voltage goes below a first voltage level smaller than the rating level. The apparatus further includes a normal restoring section which brings the head to the retract position when the power voltage goes below a second voltage level smaller than the rating level but greater than the first voltage level. Three voltage levels, thus, are involved -- the rating level, the first voltage level, and the second voltage level.

In another embodiment, when the power voltage is above a first predetermined level,

the power voltage is provided to the rotation drive motor and the head drive motor of the disk drive apparatus, and when the power voltage is equal to or less than the first predetermined level and above a second predetermined level, the power voltage is provided to the head drive motor to drive the head toward the periphery of the information recording disk. Again, three voltage levels are involved -- above the first predetermined level, below the first predetermined level but above the second predetermined level, and below the second predetermined level. In a preferred embodiment, when the power voltage is below the second predetermined level, back electromotive force is provided to drive the head to the periphery of the information recording disk.

The References

Patton discloses a method and apparatus for controlling disk drive head parking during power interruption. If power drops below a predetermined threshold, the head is brought to the retract position. Patton only involves two voltage levels -- host DC power and the predetermined threshold.

Smith discloses a method and apparatus for operating a vehicle mounted disk drive storage device. There is no disclosure or suggestion of a forcible restoring section which forcibly brings the head of the apparatus to a retract position when the power voltage goes below a first voltage level smaller than the rating level and a normal restoring section which brings the head to the retract position when the power voltage goes below a second voltage level smaller than the rating level but greater than the first voltage level.

Kao discloses a vehicle navigation system. There is no disclosure or suggestion of a forcible restoring section which forcibly brings the head of the apparatus to a retract position

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when the power voltage goes below a first voltage level smaller than the rating level and a normal restoring section which brings the head to the retract position when the power voltage goes below a second voltage level smaller than the rating level but greater than the first voltage level.

Argument

Whether considered separately or in combination, the references do not disclose or suggest a disk drive apparatus or a method of controlling a head drive section in which a forcible restoring section forcibly brings the head of the apparatus to a retract position when the power voltage goes below a first voltage level smaller than the rating level and a normal restoring section brings the head to the retract position when the power voltage goes below a second voltage level smaller than the rating level but greater than the first voltage level.

The October 6, 2003 Office Action rejected the claims on the basis of Latham, et al., United States Patent No. 5,473,328. The March 17, 2004 Office Action no longer relies on Latham et al., but nevertheless includes comments as to the applicability of Latham et al. to the present claims. Those comments include the contention that Latham et al. includes “the instant conditions as claimed -- forcible restoring ... and normal restoring”. Latham et al. may disclose forcible restoring and normal restoring, but Latham et al., and also Patton, do not disclose or suggest the claimed invention. That is, neither Patton nor Latham et al. shows or suggests forcibly bringing the head of the disk drive apparatus to a retract position when the power voltage goes below a first voltage level smaller than the rating level and bringing the head to the retract position when the power voltage goes below a second voltage level smaller than the rating level but greater than the first voltage level.

On its page 3 the Office Action sets forth the two “sections” of Applicants’ disk drive apparatus recited in claim 1 and contends that these sections are shown in specified passages in Patton. This contention is traversed.

The Office Action contends that Patton discloses “a forcible restoring section for controlling the head drive section to forcibly bring the head to a retract position when the power voltage goes below a first voltage level smaller than the rating level” at column 2, lines 18-38 and column 5, lines 19-49. It is acknowledged that at column 2, lines 18-38 Patton discloses that if power is lost -- i.e., falls below the host DC power -- the head is forcibly brought to the retract position. Likewise, it is acknowledged that at column 5, lines 19-49 Patton discloses that if the host DC power signal drops below a predetermined threshold, the head is forcibly brought to the retract position. Thus, the “first voltage level” is the predetermined threshold level.

Then, however, the Office Action contends that at column 4, line 16 to column 5, line 10 and at column 5, line 64 to column 6, line 36, Patton also discloses “a normal restoring section for controlling the head drive section to move the head toward the retract position on the basis of the power voltage while the power voltage is smaller than the rating level but greater than the first voltage level.”

At column 4, line 16 to column 5, line 10 Patton states that a computer may provide both 5 V DC and 12 V Dc to its disk drive, but also states that before reaching the disk drive the voltage is passed through a voltage regulator to regulate the voltage applied to the disk drive to 5 V DC or 3.3 V DC. Patton further states that two or more regulated voltages may be provided. There is no mention in this passage of the voltage dropping or of parking the

head.

At column 5, 64 to column 6, line 36 Patton describes the manner in which his disk drive determines the position of the head in order to determine how far it must be moved in order to be parked. That passage does not discuss the condition under which the head is parked. The condition is described at column 5, lines 19-49 which, as discussed above, merely states that the head is forcibly parked when the host DC power signal drops below a predetermined threshold. There is no mention or suggestion in Patton of forcibly bringing the head to a retract position when the power voltage goes below a first voltage level smaller than the rating level and of bringing the head to the retract position when the power voltage goes below a second voltage level smaller than the rating level but greater than the first voltage level. There is no mention or suggestion of three voltage levels.

Each of the claims includes bringing the head of the apparatus to a retract position, either forcibly or with back electromotive force, when the power voltage goes below a first voltage level smaller than the rating level, and bringing the head to the retract position, either normally or with the power voltage, when the power voltage goes below a second voltage level smaller than the rating level but greater than the first voltage level. This is neither shown nor suggested by the references. It is accordingly submitted that the claims are allowable.

The Drawings

It has been noted that although the Submission of Replacement Drawing Sheets Including Drawing Corrections filed December 30, 2003 proposed to correct Figure 8A to agree with the paragraph of the specification commencing at page 11, line 19, the

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Replacement Sheet had an error. That has been corrected by the above-discussed drawing correction.

Conclusion

In view of the foregoing, Applicants submit that claims 1-9, 11-15, and 17-24, all the claims presently pending in the application, are patentably distinct over the prior art of record and that the application is in condition for allowance. Such action would be appreciated.

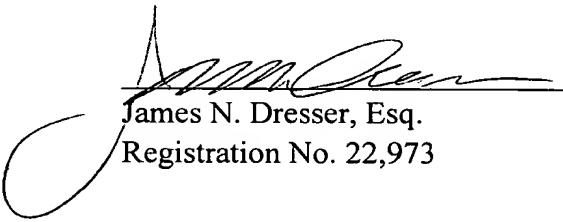
Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned attorney at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

To the extent necessary, Applicants petition for an extension of time under 37 CFR §1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to Attorney's Deposit Account No. 50-0481 and please credit any excess fees to such deposit account.

Respectfully Submitted,

Date:

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FIG. 8A

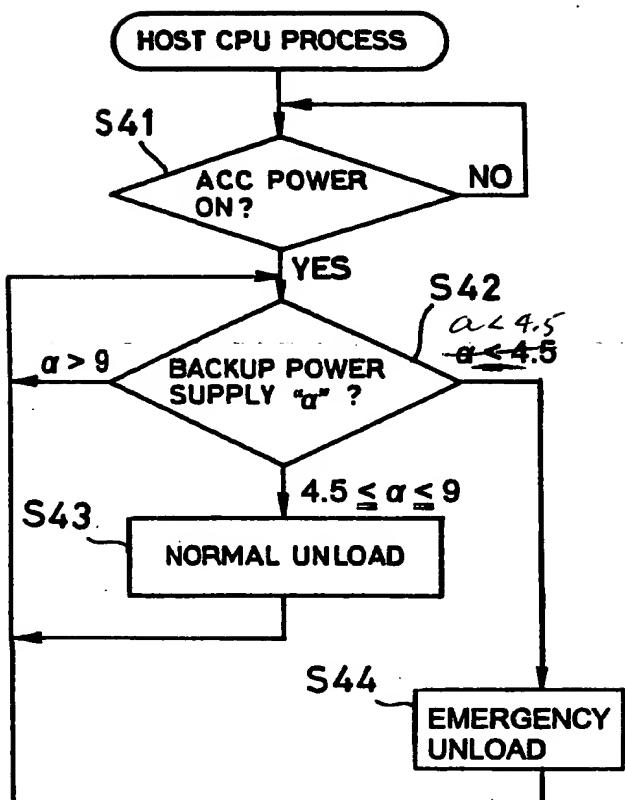


FIG. 8B

